Houston **Bikeway** Program

Transportation Planning

Proposed Extensions and Connectors

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Bicycle travel plays a role in transportation, especially in cities and urbanized regions. The Transportation Equity Act for the 21st Century (TEA-21) continues to encourage and support the development of bicycle facilities. Bicycling is recognized as a viable transportation model in our society. The use of a bicycle for commuting and other travel purposes is increasing. More and more people are recognizing and believing bicycling is an energy-efficient, cost-effective, health and environmentally sound method of transportation.

The Houston Bikeway Program was established in 1993. The system has a network of over 260 miles of both on-street and off-street paths successfully in operation. Another 120 miles are in development and will be completed by next year. The pilot project, a part of the development of the Houston Bicycle Program, consists of conducting preliminary surveys and planning for 16 logical connectors and extensions. The proposed connectors and extensions under this report will enhance and improve the performance of the existing bikeway system. With other projects and strategies, it will continuously increase the safety, security, accessibility and mobility options of transportation for non-motorized users, as well as protection of the environment and improvement of quality of life

The pilot project has focused mainly on looking for feasible extensions and connectors within the local network and those that connect to external networks. The primary goals and objectives are:

1. Identifying the existing conditions and problems of the feasible connectors and extensions.

2. Analyzing traffic conditions, neighborhood needs, related effecting factors, and selecting a proper bikeway model for the planned connectors or extensions.

The steps of the project include following: first, the field survey and investigation conducted to identify the existing conditions and problems. The collection of field data and creation of a database for storage of the collected data to also provide a resource data for further planning. To select a proper bikeway model for the planned connectors and extensions, the existing conditions are examined. Finally, recommendations or suggestions are given. Based on the above steps and review of related documents, this paper attempts to give a transportation planning strategy for each bikeway connector or extension. The following are examples of a bikeway plan. Two particular bikeway plans are on different sites; one is on an existing street and another one is in undeveloped land.

Calhoun is a street that is located in an urbanized region and should be classified into a collector. The south and north terminals of the street are towards and close to Loop 610 and I-45. On the street, there is already a segment with a bike lane in use. The street connects the proposed multi-use trail along Brays Bayou and another bike lane on Griggs Street. With this planned extension and another proposed bikeway connector, Calhoun will become a street that has a bike lane throughout the whole length.

The planned bikeway in Calhoun Street is a length of 1175 ft segment. It begins from a bridge over Brays Bayou at N. MacGregor Way and to the north terminal of Calhoun. This segment is close to downtown and located in a residential area and also along the main campus of UH. The park, recreational centers, dormitories, hotel and

libraries of UH are located along the segment. It also connects several minor streets, which flow through the residential areas and interesting places.

This segment in Calhoun Street is a two-lane street; dependent on passed locations, it can become three-lane. The terminal part of the street in the UH campus has a raised median and exclusive turning pockets for left turns. The street is curbed and the pavement is concreted. The width of the lane is 11 ft; the speed limit is 35 mph, no bus line or bus stop is in this segment. Sidewalks are on both sides of the street, but only the part in UH campus is in good condition and well maintained. It has a width of 5.5 or 6 ft and is wider than the common width of 4 ft. It leads to the inside of the campus, as well as connecting to buildings, libraries and other facilities. The traffic contents on this segment consist primarily of residents, and student commuters. Another feature of this segment is several large parking lots are on both sides of street.

Like Calhoun Street, Elgin Street is around the north side of UH. It is a two-lane street and is separated by median. Elgin connects directly with I-45 and is a main entrance and exit for UH students. Its position is not like the indication on the map; Elgin doesn't have a cross with Calhoun. The sidewalks with width of 4 ft are on both sides. Also, several large parking lots are around street. This segment has different traffic content than that of Calhoun. There is a higher demand of motor vehicle traffic which are students and other through traffic on the street.

The new facilities of UH (such as campus recreational center and dormitories) located around Calhoun and other roads (Texas Spur 5, UH University Dr.) are in use. These have changed the traffic situation and functions of planned segment in Calhoun. A large part of planned segment (especially, from Wheeler to the end of Calhoun) serves for

just a campus route. As a result, there is only non-motorized and motorized traffic of students, which cause more crossing pedestrians in this segment. In expectation of the use of dormitory buildings in Fall Semester this year, the demand of non-motorized and motorized traffic, as well as the bicycle user will continuously increase.

Reviewing the environment of the planned segment and its existing conditions, the suitability for bicyclist is examined. In this area, the bicycle user generators and its destinations are concentrated with suitable accessing distance for bicycling. These facilities are also significant attractions for people outside of the area. The traffic conditions are suitable for adding bicycling traffic and the available space is sufficient for on-street or off-street models. The existing bicycle users are identified and the future needs and potential users will increase.

According to the observing, analysis of affecting factors, and bicycling needs, there are more reasons for choosing an on-street bikeway model for this segment. That means reducing the number of vehicular lanes to accomplish adding a bike lane on the existing pavement surface. This model consists with the existing bike lane and it is also possible in physical condition.

The on-street model for this new extension in Calhoun should have better performances and impacts on the neighborhood. First of all, it is cost effective. There is almost no need for construction on the street or pavement and can be accomplished in very short time. To further reduce the cost, the painting of redesigned pavement markings can integrate with pavement maintenance. Second, it is not a effecting factor to influence on traffic flow. The traffic content will not be changed and affected. The capacity of the planned segment still can accommodate the traffic volume, because the number of lanes

is equal to or even more than the number of upstream lanes. Third, it has more beneficial impacts. It will have more positive impacts of accessibility, convenience, protecting, and raising the quality of environment, more option for non-motorist, and for the community. There are not disadvantages on existing operating facilities or equipments.

The number of lanes of the planned segment on campus is 3. It has exclusive turning pockets for left turns and with a raised median. The width of lane is 11 ft; Speed Limit is 35 mph and there are no bus lines or bus stops in this segment. Another feature of this segment is several large parking lots for students are at both sides of street.

Examining the planned segment, there are still other issues of continuity and accessibility. The current situation of the intersection, which shares with Calhoun, Wheeler, and M L King has caused a problem of continuity and accessibility for traffic flow. This intersection is a four-leg intersection, Wheeler has two legs, Calhoun and M L King each has one leg. The north bound of Calhoun doesn't directly connect with the intersection; it connects only with south bound of M L King. Calhoun is a two-way (south and north bound) street, but it connects M L King Street only in one-way (south bound). As a result, any north bound traffic in Calhoun is impeded and can only continue south bound on M L King Street. This is going into the opposite direction of UH campus.

Another problem of continuity and accessibility occurs at end of Calhoun Street. Although it is closed to Elgin and I-45, there is no way to access or connect any other route. This is not only an obstruction to the connection in campus, but also an impediment in the network. At this end point, it will have the chances to access or connect to bikeway in Cullen, Elgin Streets, and the proposed bikeway in Lockwood and

Scharpe Street. The Calhoun Street physically ends at this point, there is not an existing street to add a bikeway to. It needs a new design and construction.

To have better performances of the on-street bikeway extension, the following suggestions are recommended:

- Creating more connections to increase continuity and accessibility for bicycling travel.

  The intersection of Calhoun and Wheeler should be improved. This can be accommodated as following: redesigning the sharing of intersection; building a special path for bicycling travel to cross Wheeler Street without passing the intersection.

  The end point of Calhoun should be developed for continuity and can use one of following: connecting the bikeway in Elgin Street, connecting the underpass of I-45 or feeding way.

- Adding more access ways and facilities to destinations in the area.

  This will provide more convenience to bicyclist directly accessing their destinations and parking or storing bike. It includes bikeways can access to entrances or doors of destination, and safe store bike there.

- Improving safety at intersections.

  It relates signal timing giving priority to bicyclist to cross or turn at intersection. This can set special buttons for bicyclist to get additional time to cross intersection.

Another planning of a bikeway extension (trail) is along Keegans Bayou. This is a 3.75 miles segment. This segment is significant, because it is an elongate of proposed

multi-use trail along the Bayou, which is throughout almost all of the Harris County. The segment begins from a bridge over Braes Bayou and ends in a bridge in Synott Street. Although the planned bikeway passes a residential region, its particular site is in undeveloped land. In fact, it is on a bank of the Bayou.

The area of the planned trail segment is a highly developed residential area with well-planned living environment, houses, and routes system. The area is close to Freeway 59 and Beltway 8, and there is a higher density of population. The planned bikeway crosses several streets such as Kirkwood, Dairy Ashford, which is concentrated with small commercial centers and interesting places. Looking around the site, a number of apartments, back yards and fence are directly set up on the banks. In some areas, it is very congested.

By inventory of existing conditions, it can be found that potential accessibility to the major streets, and the continuity for long distance destinations and even to downtown are advanced. Other focuses for this proposed bikeway are the bicycle user generators and the destinations. Both concentrated around Bayou in this area. The planned bikeway also provides the option for non-motorized riding to reach short- and long-distance destinations. The physical and geographic conditions for the planned bikeway are pretty good in most part. Although the bayou's bed is relatively deep and not to be concreted, banks still have acceptable solid soil foundation, and provide flat and available space.

According to the observation, survey and analysis, as well as the function in the network, a two-way bicycle path on a separate right of way should be a proper model for this extension. That should not only cover the use of bicyclist, but also reach the needs of pedestrian and exerciser.

A number of apartments and houses are on the bank; there are many chances and options to get the access from trail directly to apartments and houses and inside routes. The planed trail and other facilities will bring comfort and convenience for bicyclists and residents. On the other side, the high density of houses and apartments on both sides along bayou will generate sufficient bicyclist and users for the planed trail.

To integrate with the existing route system in surrounding residential areas and enhance the performance of the path to meet the travel needs of bicycling and public, the following considerations and suggestions are recommended:

- Developing the bike path into a bike corridor.

  It will be like a "freeway" for bicyclist, and serve for multi-purposes of bicycling travel, and provide more options to access more destinations.

- Improving more accessing ways to increase accessibility to path and sides of Bayou.

  Insufficient access-way often results in lower service levels of the bicycle path and raising limitations for bicyclist and other users. For example, along Bellfort Street from Wilcrest to Kirkwood (about 1.7 miles), there are hundreds of families, and only one access-way (Lausbury Street) getting into the south side of bank.

- Improving crossing path in streets.

  Meeting streets that cut the banks; no existing streets has a crossing path for continuity of the bank. This is also a critical problem of bicycling safety.

- Lighting to improve the level of safety and security and operational conditions.

The night use of residential and bicyclist on this path is expected. Lighting is important and necessary for the shared use path. It prevents extreme accidents, raises the level of safety and security in nighttime. With lighting the path will be more attractive to users.

- Creating road guides, indicators and improvement of signs.

  Road guide and indicator can help bicyclist orienting directions and identifying location and distance to their destinations. It will be more important, when this shared use path is completed and serves as a long, uninterrupted collector for bicycling public.

Bikeway network planning associates many aspects and there are many factors taken into considerations. This paper just presents a basic planning procedure of bikeway and explores its practice in the real project environment.

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